

THE ASTROPHYSICAL JOURNAL  
CONTENTS OF VOLUME 582, PART 1

2003 JANUARY 1, NUMBER 1

	Page
EDITORIAL TRANSITIONS	1
INTRINSIC DEGENERACY OF GRAVITATIONAL LENS TIME DELAYS: THE CASE FOR A SIMPLE QUADRUPLE SYSTEM IN A COLD DARK MATTER COSMOLOGY <i>HongSheng Zhao &amp; Bo Qin</i>	2
THE CANADA-UNITED KINGDOM DEEP SUBMILLIMETER SURVEY. V. THE SUBMILLIMETER PROPERTIES OF LYMAN BREAK GALAXIES <i>T. M. Webb, S. Eales, S. Foucaud, S. J. Lilly, H. McCracken, K. Adelberger, C. Steidel, A. Shapley, D. L. Clements, L. Dunne, O. Le Fèvre, M. Brodwin, &amp; W. Gear</i>	6
LENSING AND THE CENTERS OF DISTANT EARLY-TYPE GALAXIES <i>Charles R. Keeton</i>	17
EVENT RATES AND TIMESCALE DISTRIBUTIONS FROM REALISTIC MICROLENSING MODELS OF M31 <i>Edward A. Baltz, Geza Gyuk, &amp; Arlin Crotts</i>	30
MOLECULAR GAS AND DUST AT $z = 2.6$ IN SMM J14011+0252: A STRONGLY LENSED ULTRALUMINOUS GALAXY, NOT A HUGE MASSIVE DISK <i>D. Downes &amp; P. M. Solomon</i>	37
THE CHEMICAL UNIFORMITY OF HIGH- $z$ DAMPED Ly $\alpha$ PROTOGALAXIES © <i>Jason X. Prochaska</i>	49
SUBARU DEEP SURVEY. II. LUMINOSITY FUNCTIONS AND CLUSTERING PROPERTIES OF Ly $\alpha$ EMITTERS AT $z = 4.86$ IN THE SUBARU DEEP FIELD <i>Masami Ouchi, Kazuhiro Shimasaku, Hisanori Furusawa, Masayuki Miyazaki, Mamoru Doi, Masaru Hamabe, Tomoki Hayashino, Masahiko Kimura, Keiichi Kodaira, Yutaka Komiyama, Yuichi Matsuda, Satoshi Miyazaki, Fumiaki Nakata, Sadanori Okamura, Maki Sekiguchi, Yasuhiro Shioya, Hajime Tamura, Yoshiaki Taniguchi, Masafumi Yagi, &amp; Naoki Yasuda</i>	60
ACCRETION OF LOW ANGULAR MOMENTUM MATERIAL ONTO BLACK HOLES: TWO-DIMENSIONAL HYDRODYNAMICAL INVISCID CASE <i>Daniel Proga &amp; Mitchell C. Begelman</i>	69
TRACING THE WARM-HOT INTERGALACTIC MEDIUM AT LOW REDSHIFT: X-RAY FOREST OBSERVATIONS TOWARD H1821+643 <i>Smita Mathur, David H. Weinberg, &amp; Xuelei Chen</i>	82
THE X-RAY SPECTRUM OF THE SEYFERT I GALAXY MARKARIAN 766: DUSTY WARM ABSORBER OR RELATIVISTIC EMISSION LINES? <i>K. O. Mason, G. Branduardi-Raymont, P. M. Ogle, M. J. Page, E. M. Puchnarewicz, E. Behar, F. A. Córdova, S. Davis, L. Maraschi, I. M. McHardy, P. T. O'Brien, W. C. Priedhorsky, &amp; T. P. Sasseen</i>	95
THE KINEMATICS AND PHYSICAL CONDITIONS OF THE IONIZED GAS IN MARKARIAN 509. I. CHANDRA HIGH ENERGY GRATING SPECTROSCOPY <i>Tahir Yaqoob, Barry McKernan, Steven B. Kraemer, D. Michael Crenshaw, Jack R. Gabel, Ian M. George, &amp; T. Jane Turner</i>	105
THE KINEMATICS AND PHYSICAL CONDITIONS OF THE IONIZED GAS IN MARKARIAN 509. II. STIS ECHELLE OBSERVATIONS © <i>S. B. Kraemer, D. M. Crenshaw, T. Yaqoob, B. McKernan, J. R. Gabel, I. M. George, T. J. Turner, &amp; J. P. Dunn</i>	125
ACCRETION ONTO THE SUPERMASSIVE BLACK HOLE IN M87 <i>Tiziana Di Matteo, Steven W. Allen, Andrew C. Fabian, Andrew S. Wilson, &amp; Andrew J. Young</i>	133
TIDAL EFFECTS IN CLUSTERS OF GALAXIES <i>Oleg Y. Gnedin</i>	141
MODELS OF GALAXY CLUSTERS WITH THERMAL CONDUCTION <i>Nadia L. Zakamska &amp; Ramesh Narayan</i>	162
KINEMATICS OF PLANETARY NEBULAE IN M51's TIDAL DEBRIS <i>Patrick R. Durrell, J. Christopher Mihos, John J. Feldmeier, George H. Jacoby, &amp; Robin Ciardullo</i>	170
CHANDRA OBSERVATION OF LUMINOUS AND ULTRALUMINOUS X-RAY BINARIES IN M101 <i>K. Mukai, W. D. Pence, S. L. Snowden, &amp; K. D. Kuntz</i>	184

	Page
CENTRAL MASS CONCENTRATION AND BAR DISSOLUTION IN NEARBY SPIRAL GALAXIES <i>Mousumi Das, Peter J. Teuben, Stuart N. Vogel, Michael W. Regan, Kartik Sheth, Andrew I. Harris, &amp; William H. Jefferys</i>	190
TO CIRCULARIZE OR NOT TO CIRCULARIZE?—ORBITAL EVOLUTION OF SATELLITE GALAXIES <i>Yoshikazu Hashimoto, Yoko Funato, &amp; Junichiro Makino</i>	196
UNCERTAINTIES OF SYNTHETIC INTEGRATED COLORS AS AGE INDICATORS <i>Sukyoung K. Yi</i>	202
MAGNETIC RECONNECTION TRIGGERED BY THE PARKER INSTABILITY IN THE GALAXY: TWO-DIMENSIONAL NUMERICAL MAGNETOHYDRODYNAMIC SIMULATIONS AND APPLICATION TO THE ORIGIN OF X-RAY GAS IN THE GALACTIC HALO <i>Syuiti Tamuma, Takaaki Yokoyama, Takahiro Kudoh, &amp; Kazunari Shibata</i>	215
NONLINEAR EFFECTS IN MODELS OF THE GALAXY. I. MIDPLANE STELLAR ORBITS IN THE PRESENCE OF THREE-DIMENSIONAL SPIRAL ARMS <i>Barbara Pichardo, Marco Martos, Edmundo Moreno, &amp; Julia Espresate</i>	230
THE LARGE-SCALE BIPOLAR WIND IN THE GALACTIC CENTER <i>Joss Bland-Hawthorn &amp; Martin Cohen</i>	246
LIMITS TO THE CASSIOPEIA A $^{44}\text{Ti}$ LINE FLUX AND CONSTRAINTS ON THE EJECTA ENERGY AND THE COMPACT SOURCE <i>R. E. Rothschild &amp; R. E. Lingenfelter</i>	257
LABORATORY PRECISION MEASUREMENTS OF THE ROTATIONAL SPECTRUM OF $^{12}\text{C}^{17}\text{O}$ AND $^{13}\text{C}^{17}\text{O}$ <i>Gabriele Klapper, Leonid Surin, Frank Lewen, Holger S. P. Müller, Igor Pak, &amp; Gisbert Winnewisser</i>	262
STELLAR OUTFLOWS DRIVEN BY MAGNETIZED WIDE-ANGLE WINDS <i>T. A. Gardiner, A. Frank, &amp; L. Hartmann</i>	269
FROM MASSIVE PROTOSTARS TO A GIANT H II REGION: SUBMILLIMETER IMAGING OF THE GALACTIC MINISTARBURST W43 <i>F. Motte, P. Schilke, &amp; D. C. Lis</i>	277
THREE-DIMENSIONAL SIMULATIONS OF JETS FROM KEPLERIAN DISKS: SELF-REGULATORY STABILITY <i>Rachid Ouyed, David A. Clarke, &amp; Ralph E. Pudritz</i>	292
HOW SAMPLE COMPLETENESS AFFECTS GAMMA-RAY BURST CLASSIFICATION <i>Jon Hakkila, Timothy W. Giblin, Richard J. Roiger, David J. Haglin, William S. Paciesas, &amp; Charles A. Meegan</i>	320
THE MYRIAD-SOURCE MODEL OF COSMIC RAYS. I. STEADY STATE AGE AND PATH LENGTH DISTRIBUTIONS <i>J. C. Higdon &amp; R. E. Lingenfelter</i>	330
CHARGED BLACK HOLES: WAVE EQUATIONS FOR GRAVITATIONAL AND ELECTROMAGNETIC PERTURBATIONS <i>Zoltán Perjés &amp; Mátyás Vasúth</i>	342
PSEUDO-NEWTONIAN POTENTIALS TO DESCRIBE THE TEMPORAL EFFECTS ON RELATIVISTIC ACCRETION DISKS AROUND ROTATING BLACK HOLES AND NEUTRON STARS <i>Banibrata Mukhopadhyay &amp; Ranjeev Misra</i>	347
COMPOSITE ACCRETION DISK AND WHITE DWARF MODEL ANALYSES OF THE QUIESCENCE OF DWARF NOVAE: EM CYGNI, CZ ORIONIS, AND WW CETI <i>Lisa Winter &amp; Edward M. Sion</i>	352
CATAclysmic VARIABLES: AN EMPIRICAL ANGULAR MOMENTUM LOSS PRESCRIPTION FROM OPEN CLUSTER DATA <i>N. Andronov, M. Pinsonneault, &amp; A. Sills</i>	358
EVIDENCE FOR OPTICAL FLARES IN QUIESCENT SOFT X-RAY TRANSIENTS <i>C. Zurita, J. Casares, &amp; T. Shahbaz</i>	369
CHANDRA X-RAY OBSERVATION OF THE ORION NEBULA CLUSTER. I. DETECTION, IDENTIFICATION, AND DETERMINATION OF X-RAY LUMINOSITIES $\oplus$ <i>E. Flaccomio, F. Damiani, G. Micela, S. Sciortino, F. R. Harnden, Jr., S. S. Murray, &amp; S. J. Wolk</i>	382
CHANDRA X-RAY OBSERVATION OF THE ORION NEBULA CLUSTER. II. RELATIONSHIP BETWEEN X-RAY ACTIVITY INDICATORS AND STELLAR PARAMETERS <i>E. Flaccomio, F. Damiani, G. Micela, S. Sciortino, F. R. Harnden, Jr., S. S. Murray, &amp; S. J. Wolk</i>	398
BERYLLIUM ABUNDANCES IN F AND G DWARFS IN THE PLEIADES AND $\alpha$ PERSEI CLUSTERS FROM KECK HIGH-RESOLUTION ECHELLE SPECTROMETER OBSERVATIONS <i>Ann Merchant Boesgaard, Eric Armengaud, &amp; Jeremy R. King</i>	410
POST-MAIN-SEQUENCE CHANGES IN ROTATIONAL VELOCITIES <i>Helmut A. Abt</i>	420

# CONTENTS

v

	Page
ARE CORONAE OF MAGNETICALLY ACTIVE STARS HEATED BY FLARES? II. EXTREME ULTRAVIOLET AND X-RAY FLARE STATISTICS AND THE DIFFERENTIAL EMISSION MEASURE DISTRIBUTION <i>Manuel Güdel, Marc Audard, Vinay L. Kashyap, Jeremy J. Drake, &amp; Edward F. Guinan</i>	423
THE LOW-VELOCITY WIND FROM THE CIRCUMSTELLAR MATTER AROUND THE B9 V STAR $\sigma$ HERCULIS <i>C. H. Chen &amp; M. Jura</i>	443
ON THE FATE OF CLOSE-IN EXTRASOLAR PLANETS <i>Ing-Guey Jiang, Wing-Huen Ip, &amp; Li-Chin Yeh</i>	449
SEVEN NEW KECK PLANETS ORBITING G AND K DWARFS <i>R. Paul Butler, Geoffrey W. Marcy, Steven S. Vogt, Debra A. Fischer, Gregory W. Henry, Gregory Laughlin, &amp; Jason T. Wright</i>	455
FORMATION OF MINOR-ION CHARGE STATES IN THE FAST SOLAR WIND: ROLES OF DIFFERENTIAL FLOW SPEEDS OF IONS OF THE SAME ELEMENT <i>Y. Chen, R. Esser &amp; Y. Hu</i>	467
A COUPLED MODEL FOR THE EMERGENCE OF ACTIVE REGION MAGNETIC FLUX INTO THE SOLAR CORONA <i>W. P. Abbett &amp; G. H. Fisher</i>	475
A TRANSIENT HEATING MODEL FOR CORONAL STRUCTURE AND DYNAMICS <i>D. Spadaro, A. F. Lanza, A. C. Lanzafame, J. T. Karpen, S. K. Antiochos, J. A. Klimchuk, &amp; P. J. MacNeice</i>	486
ACCELERATION AND ENRICHMENT OF $^3\text{He}$ IN IMPULSIVE SOLAR FLARES BY ELECTRON FIREHOSE WAVES <i>G. Paesold, R. Kallenbach, &amp; A. O. Benz</i>	495
MASS MOTIONS AND PLASMA PROPERTIES IN THE $10^7$ K FLARE SOLAR CORONA <i>E. Landi, U. Feldman, D. E. Innes, &amp; W. Curdt</i>	506
IDENTIFICATION OF SOLAR SOURCES OF MAJOR GEOMAGNETIC STORMS BETWEEN 1996 AND 2000 <i>J. Zhang, K. P. Dere, R. A. Howard, &amp; V. Bothmer</i>	520
FLUORESCENCE EFFICIENCIES OF MONODEUTERIO-METHANE IN COMETS: TOWARD THE DETERMINATION OF THE DEUTERIUM/HYDROGEN RATIO IN METHANE <i>Hideyo Kawakita &amp; Jun-ichi Watanabe</i>	534
VOYAGER 1 AND 2 OBSERVATIONS OF MAGNETIC FIELDS AND ASSOCIATED COSMIC-RAY VARIATIONS FROM 2000 THROUGH 2001: 60–87 AU <i>L. F. Burlaga, N. F. Ness, F. B. McDonald, J. D. Richardson, &amp; C. Wang</i>	540
BREIT-PAULI $R$ -MATRIX CALCULATION FOR ELECTRON IMPACT COLLISION STRENGTHS AND RATES OF O VI © <i>S. S. Tayal</i>	550
ERRATUM: "THE DYNAMICAL SIMULATIONS OF THE PLANETS ORBITING GJ 876" (ApJ, 572, 1041 [2002]) <i>Jianghui Ji, Guangyu Li, &amp; Lin Liu</i>	558
2003 JANUARY 10, NUMBER 2	
THE ASSEMBLY AND MERGING HISTORY OF SUPERMASSIVE BLACK HOLES IN HIERARCHICAL MODELS OF GALAXY FORMATION <i>Marta Volonteri, Francesco Haardt, &amp; Piero Madau</i>	559
COSMOLOGICAL IMPLICATIONS OF THE BIMA 30 GHz SUNYAEV-ZELDOVICH EFFECT GALAXY CLUSTER SURVEY <i>Yen-Ting Lin &amp; Joseph J. Mohr</i>	574
COSMOLOGICAL CONSTRAINTS FROM COMPACT RADIO SOURCE ANGULAR SIZE VERSUS REDSHIFT DATA <i>Gang Chen &amp; Bharat Ratra</i>	586
THE MASS OF QUASAR BROAD EMISSION LINE REGIONS <i>J. A. Baldwin, G. J. Ferland, K. T. Korista, F. Hamann, &amp; M. Dietrich</i>	590
METAL ABUNDANCES AND KINEMATICS OF QUASAR ABSORBERS. II. ABSORPTION SYSTEMS TOWARD Q0347–3819 AND APM BR J0307–4945 <i>S. A. Levshakov, I. I. Agafonova, S. D'Odorico, A. M. Wolfe, &amp; M. Dessauges-Zavadsky</i>	596
SHEEP: THE SEARCH FOR THE HIGH-ENERGY EXTRAGALACTIC POPULATION <i>K. Nandra, I. Georgantopoulos, A. Ptak, &amp; T. J. Turner</i>	615
THE ASCA X-RAY SPECTRUM OF ARP 102B AND EVALUATION OF SIMPLE MODELS FOR ITS ASSOCIATED, METASTABLE Fe II ABSORBER <i>Michael Eracleous, Jules P. Halpern, &amp; Jane C. Charlton</i>	633

	Page
WHAT DO THE <i>HUBBLE SPACE TELESCOPE</i> AND <i>CHANDRA</i> TELL US ABOUT THE JET AND THE NUCLEAR REGION OF THE RADIO GALAXY 3C 270? <sup>Ⓢ</sup> <i>Marco Chiaberge, Roberto Gilli, F. Duccio Macchetto, William B. Sparks, &amp; Alessandro Capetti</i>	645
IWGA J1216.9+3743: <i>CHANDRA</i> FINDS AN EXTREMELY STEEP ULTRALUMINOUS X-RAY SOURCE <i>I. Cagnoni, R. Turolla, A. Treves, J.-S. Huang, D. W. Kim, M. Elvis, &amp; A. Celotti</i>	654
CO LUMINOSITY FUNCTIONS FOR FAR-INFRARED- AND <i>B</i> -BAND-SELECTED GALAXIES AND THE FIRST ESTIMATE FOR $\Omega_{\text{H}+\text{H}_2}$ <i>Dusan Keres, Min S. Yun, &amp; J. S. Young</i>	659
TIDALLY TRIGGERED STAR FORMATION IN CLOSE PAIRS OF GALAXIES. II. CONSTRAINTS ON BURST STRENGTHS AND AGES <sup>Ⓢ</sup> <i>Elizabeth Barton Gillespie, Margaret J. Geller, &amp; Scott J. Kenyon</i>	668
STRUCTURE OF DISK-DOMINATED GALAXIES. I. BULGE/DISK PARAMETERS, SIMULATIONS, AND SECULAR EVOLUTION <sup>Ⓢ</sup> <i>Lauren A. MacArthur, Stéphane Courteau, &amp; Jon A. Holtzman</i>	689
THE FORMATION OF NUCLEAR RINGS IN BARRED SPIRAL GALAXIES <i>Michael W. Regan &amp; Peter Teuben</i>	723
STUDYING THE GALACTIC BULGE THROUGH SPECTROSCOPY OF MICROLENSSED SOURCES. II. OBSERVATIONS <i>Stephen R. Kane &amp; Kailash C. Sahu</i>	743
RESOLVING THE KINEMATIC DISTANCE AMBIGUITY TOWARD GALACTIC H II REGIONS <sup>Ⓢ</sup> <i>Michal A. Kolpak, James M. Jackson, T. M. Bania, D. P. Clemens, &amp; John M. Dickey</i>	756
THE RADIAL STRUCTURE OF SUPERNOVA REMNANT N103B <i>Karen T. Lewis, David N. Burrows, John P. Hughes, Patrick O. Slane, Gordon P. Garmire, &amp; John A. Nousek</i>	770
<i>CHANDRA</i> X-RAY IMAGING SPECTROSCOPY OF THE YOUNG SUPERNOVA REMNANT KESTEVEN 75 <i>David J. Helfand, Benjamin F. Collins, &amp; E. V. Gotthelf</i>	783
ORIGINS OF THE HIGHLY IONIZED GAS ALONG THE LINE OF SIGHT TOWARD HD 116852 <i>Andrew J. Fox, Blair D. Savage, Kenneth R. Sembach, Dirk Fabian, Philipp Richter, David M. Meyer, James Lauroesch, &amp; J. Christopher Howk</i>	793
INFERRING PHYSICAL CONDITIONS IN INTERSTELLAR CLOUDS OF H <sub>2</sub> <i>Matthew K. Browning, Jason Tumlinson, &amp; J. Michael Shull</i>	810
OBSERVATIONS OF C <sub>3</sub> IN TRANSLUCENT SIGHT LINES <i>Takeshi Oka, Julie A. Thorburn, Benjamin J. McCall, Scott D. Friedman, Lewis M. Hobbs, Paule Sonnentrucker, Daniel E. Welty, &amp; Donald G. York</i>	823
A SURVEY OF 557 GHz WATER VAPOR EMISSION IN THE NGC 1333 MOLECULAR CLOUD <i>Edwin A. Bergin, Michael J. Kaufman, Gary J. Melnick, Ronald L. Snell, &amp; John E. Howe</i>	830
ELEMENTAL ABUNDANCES AND MASS DENSITIES OF DUST AND GAS IN THE LOCAL INTERSTELLAR CLOUD <i>Hiroshi Kimura, Ingrid Mann, &amp; Elmar K. Jessberger</i>	846
EFFICIENT RADIATIVE TRANSFER IN DUST GRAIN MIXTURES <sup>Ⓢ</sup> <i>S. Wolf</i>	859
TURBULENCE IN ACCRETION DISKS: VORTICITY GENERATION AND ANGULAR MOMENTUM TRANSPORT VIA THE GLOBAL BAROCLINIC INSTABILITY <i>H. H. Klahr &amp; P. Bodenheimer</i>	869
VISCOUS DIFFUSION AND PHOTOEVAPORATION OF STELLAR DISKS <i>Isamu Matsuyama, Doug Johnstone, &amp; Lee Hartmann</i>	893
OBSERVED AND PHYSICAL PROPERTIES OF CORE-COLLAPSE SUPERNOVAE <i>Mario Hamuy</i>	905
TYPE Ia SUPERNOVAE AND HIGH-VELOCITY WHITE DWARFS <i>Brad M. S. Hansen</i>	915
A SCATTERED LIGHT ECHO AROUND SN 1993J IN M81 <i>Ji-Feng Liu, Joel N. Bregman, &amp; Patrick Seitzer</i>	919
DISCOVERY OF THE LOW-REDSHIFT OPTICAL AFTERGLOW OF GRB 011121 AND ITS PROGENITOR SUPERNOVA SN 2001ke <sup>Ⓢ</sup> <i>P. M. Garnavich, K. Z. Stanek, L. Wyrzykowski, L. Infante, E. Bendek, D. Bersier, S. T. Holland, S. Jha, T. Matheson, R. P. Kirshner, K. Krisciunas, M. M. Phillips, &amp; R. G. Carlberg</i>	924
X-RAY JET EMISSION FROM THE BLACK HOLE X-RAY BINARY XTE J1550-564 WITH <i>CHANDRA</i> IN 2000 <i>John A. Tomsick, Stéphane Corbel, Rob Fender, Jon M. Miller, Jerome A. Orosz, Tasso Tzioumis, Rudy Wijmands, &amp; Philip Kaaret</i>	933

# CONTENTS

vii

	Page
X-RAY EMISSION FROM THE JETS OF XTE J1550-564 <i>P. Kaaret, S. Corbel, J. A. Tomsick, R. Fender, J. M. Miller, J. A. Orosz, A. K. Tzioumis, &amp; R. Wijnands</i>	945
A DISK-JET INTERACTION MODEL FOR THE X-RAY VARIABILITY IN MICROQUASARS <i>L. Nobili</i>	954
RESOLVING THE EFFECTS OF RESONANT X-RAY LINE SCATTERING IN CENTAURUS X-3 WITH <i>CHANDRA</i> <i>Patrick S. Wojdowski, Duane A. Liedahl, Masao Sako, Steven M. Kahn, &amp; Frederik Paerels</i>	959
A 3 YEAR LONG EXTREME SCATTERING EVENT IN THE DIRECTION OF THE MILLISECOND PULSAR J1643-1224 <i>V. Maitia, J.-F. Lestrade, &amp; I. Cognard</i>	972
SEARCH FOR THE OPTICAL COUNTERPART OF THE NEARBY PULSAR PSR J0108-1431 <i>Roberto P. Mignani, Richard N. Manchester, &amp; George G. Pavlov</i>	978
HYDRODYNAMIC MODELS OF LINE-DRIVEN ACCRETION DISK WINDS. III. LOCAL IONIZATION EQUILIBRIUM <i>Nicolas Antonio Pereyra &amp; Timothy R. Kallman</i>	984
IMPROVED ASTROMETRY AND PHOTOMETRY FOR THE LUYTEN CATALOG. I. BRIGHT STARS <i>Andrew Gould &amp; Samir Salim</i>	1001
IMPROVED ASTROMETRY AND PHOTOMETRY FOR THE LUYTEN CATALOG. II. FAINT STARS AND THE REVISED CATALOG © <i>Samir Salim &amp; Andrew Gould</i>	1011
A FLARED, ORBITING, DUSTY DISK AROUND HD 233517 <i>M. Jura</i>	1032
COOL BOTTOM PROCESSES ON THE THERMALLY PULSING ASYMPTOTIC GIANT BRANCH AND THE ISOTOPIC COMPOSITION OF CIRCUMSTELLAR DUST GRAINS <i>Kenneth M. Nollett, M. Busso, &amp; G. J. Wasserburg</i>	1036
THE MOLECULAR LINE OPACITY OF MgH IN COOL STELLAR ATMOSPHERES <i>P. F. Weck, A. Schweitzer, P. C. Stancil, P. H. Hauschildt, &amp; K. Kirby</i>	1059
FeH ABSORPTION IN THE NEAR-INFRARED SPECTRA OF LATE M AND L DWARFS <i>Michael C. Cushing, John T. Rayner, Sumner P. Davis, &amp; William D. Vacca</i>	1066
<i>CHANDRA</i> , EXTREME ULTRAVIOLET EXPLORER, AND VERY LARGE ARRAY OBSERVATIONS OF THE ACTIVE BINARY SYSTEM $\sigma^2$ CORONAE BOREALIS <i>Rachel A. Osten, Thomas R. Ayres, Alexander Brown, Jeffrey L. Linsky, &amp; Anita Krishnamurthi</i>	1073
ADAPTIVE OPTICS OBSERVATIONS OF VEGA: EIGHT DETECTED SOURCES AND UPPER LIMITS TO PLANETARY-MASS COMPANIONS <i>Stanimir A. Metchev, Lynne A. Hillenbrand, &amp; Russel J. White</i>	1102
VERY LOW MASS STARS AND BROWN DWARFS IN TAURUS-AURIGA <i>Russel J. White &amp; Gibor Basri</i>	1109
THE EXPLORE PROJECT. I. A DEEP SEARCH FOR TRANSITING EXTRASOLAR PLANETS <i>G. Mallén-Ornelas, S. Seager, H. K. C. Yee, D. Minniti, Michael D. Gladders, G. M. Mallén-Fullerton, &amp; T. M. Brown</i>	1123
SUBMILLIMETER OBSERVATIONS OF AN ASYMMETRIC DUST DISK AROUND FOMALHAUT <i>W. S. Holland, J. S. Greaves, W. R. F. Dent, M. C. Wyatt, B. Zuckerman, R. A. Webb, C. McCarthy, I. M. Coulson, E. I. Robson, &amp; W. K. Gear</i>	1141
EXTRASOLAR PLANET FINDING VIA OPTIMAL APODIZED-PUPIL AND SHAPED-PUPIL CORONAGRAPHS <i>N. Jeremy Kasdin, Robert J. Vanderbei, David N. Spergel, &amp; Michael G. Littman</i>	1147
ON THE EXTREME-ULTRAVIOLET/ULTRAVIOLET PLASMA DIAGNOSTICS FOR NITROGEN-LIKE IONS FROM SPECTRA OBTAINED BY <i>SOHO</i> /SUMER <i>A. Mohan, E. Landi, &amp; B. N. Dwivedi</i>	1162
MAGNETIC PINCHING OF HYPERBOLIC FLUX TUBES. I. BASIC ESTIMATIONS <i>V. S. Titov, K. Galsgaard, &amp; T. Neukirch</i>	1172
CLAMSHELL AND TIPPING INSTABILITIES IN A TWO-DIMENSIONAL MAGNETOHYDRODYNAMIC TACHOCLINE <i>Paul S. Cally, Mausumi Dikpati, &amp; Peter A. Gilman</i>	1190
THE DYNAMIC EVOLUTION OF TWISTED MAGNETIC FLUX TUBES IN A THREE-DIMENSIONAL CONVECTING FLOW. I. UNIFORMLY BUOYANT HORIZONTAL TUBES <i>Y. Fan, W. P. Abbett, &amp; G. H. Fisher</i>	1206
IMBALANCED WEAK MAGNETOHYDRODYNAMIC TURBULENCE <i>Yoram Lithwick &amp; Peter Goldreich</i>	1220

	<i>Page</i>
INDIRECT X-RAY LINE-FORMATION PROCESSES IN IRON L-SHELL IONS    © <i>M. F. Gu</i>	1241
STELLAR NEUTRON CAPTURE ON PROMETHIUM: IMPLICATIONS FOR THE <i>s</i> -PROCESS NEUTRON DENSITY <i>R. Reifarth, C. Arlandini, M. Heil, F. Käppeler, P. V. Sedyshev, A. Mengoni, M. Herman, T. Rauscher, R. Gallino, &amp; C. Travaglio</i>	1251
$B' \leftarrow X$ ROVIBRATIONALLY RESOLVED PHOTODISSOCIATION OF $^{24}\text{MgH}$ <i>P. F. Weck, P. C. Stancil, &amp; K. Kirby</i>	1263
ERRATUM: "DETECTION OF A SUPER-STAR CLUSTER AS THE IONIZING SOURCE IN THE LOW-LUMINOSITY ACTIVE GALACTIC NUCLEUS NGC 43031" (ApJ, 579, 545 [2002]) <i>Luis Colina, Rosa Gonzalez Delgado, J. Miguel Mas-Hesse, Claus Leitherer, &amp; Elena Jiménez Bailón</i>	1269

